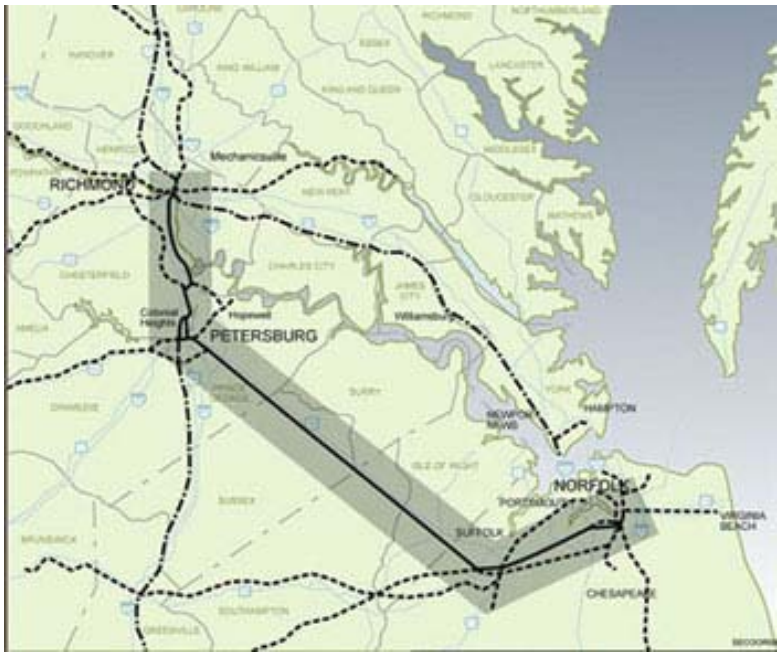
Richmond to South Hampton Roads High-Speed Rail Feasibility Study

FINDINGS AND RECOMMENDATIONS



Virginia Department of
Rail and Public Transportation

April 2002

In 2000 The General Assembly of Virginia directed the Department of Rail and Public Transportation (DRPT) to conduct a study to determine the feasibility of implementing high speed rail service between Richmond and South Hampton Roads using the existing railroad tracks that parallel U.S. Route 460. Item 525, Section N (Page 402) of the FY 2001 Appropriations Act states that:

> "Any funding provided to Route 460 Improvements from Suffolk to Petersburg shall include the necessary feasibility, environmental and demand analyses for consideration of high speed rail."

The purpose of this study is to determine the feasibility of providing direct high speed rail service from Richmond to South Hampton Roads via Petersburg and Suffolk using existing rail lines. The study is a "Fatal Flaws" analysis which is directed to determine if there are conditions which would make high speed rail service extremely difficult or impractical to implement. The main objectives of the proposed service are to minimize the end-to-end rail travel time and maximize capacity in order to provide fast, frequent, reliable and comfortable passenger service, and to maintain and enhance the ability of the host railroads to move freight in the same corridor.

The study includes three major tasks:

- An analysis of the engineering feasibility of operating high speed rail to South Hampton Roads along the existing Norfolk Southern and CSX rail lines. This task includes the selection of a preferred route and the identification of station locations.

- A projection of the potential ridership demand and revenue for the proposed service. This task includes the analysis of several different service scenarios with varying levels of frequency and speed.

- An survey of environmental conditions along the selected alternative route to determine the potential for major environmental issues. Issues addressed include: water and wetland resources, cultural resources, threatened and endangered species and wildlife, superfund sites, air, noise, public parks, recreation areas, wildlife refuges and historical properties.

Conclusions

The analysis of current and projected railroad operations and facilities on the Richmond–South Hampton Roads Corridor has led to the following conclusions:

- **Feasibility of high-speed service:** Reliable high-speed passenger train service between Richmond and South Hampton Roads is a feasible goal **provided** that requisite infrastructure improvements are constructed.
- **Travel Times - Richmond to South Hampton Roads:** Scheduled trip times, Main Street Station to Norfolk terminal, decreases as the maximum authorized speed increases, ranging from 1-hour 43 minutes at 79 mph, to 1-hour 35 minutes at 90 mph, to 1-hour 31 minutes at 110 mph. Travel times between Richmond and Newport News, at 79 mph, is 1-hour 30 minutes.
- **Cost of Improvements:** This study estimates the cost of the recommended improvements to be $235.8 million. This price includes only those improvements between the connection to the Southeast High Speed Rail corridor in Petersburg and Norfolk. It is assumed for the purposes of this study that improvements between Richmond and Petersburg will be completed as part of the Southeast High Speed Rail initiative. The majority of the recommended improvements provide the connections, capacity and station facilities necessary to operate passenger trains at any speeds. There are some savings, however, if the maximum passenger train speed is limited to 79 mph. The estimate for the cost of improvements for 79 mph operations is $188.4 million.
- **Total Trips – South Hampton Roads to Richmond to Washington to Northeast Corridor:** Total trips increase significantly as the maximum speed and frequency of South Hampton Roads service increase. By the year 2025 Newport News-only service, without speed or frequency increases, would total 240,200 passengers annually. The addition of the South Hampton Roads service would increase the annual ridership to 508,100.
- **Protection of all freight and passenger services:** Computerized simulations of the operations of all users of this Corridor (freight and Amtrak) have identified a number of specific infrastructure changes that would provide the capacity to reliably handle all existing and projected services. Even with these changes, close scheduling and dispatching coordination among operators—extending to the Washington - Richmond and Richmond - Raleigh Corridors and other contiguous routes—would be necessary to optimize the use of the improved facility and preserve the dependability and marketability of all passenger and freight operations.
- **Need for further analysis:** Between Newport News and Richmond, on the existing CSXT line, the affect on ridership of altering service frequency, increasing maximum authorized speeds, and providing sufficient capacity to reliably operate the enhanced service, should be evaluated to assist in the prioritization of passenger rail funding in the Richmond to Hampton Roads corridor.
- **Need for further engineering:** Further detailed engineering would be needed to verify the constructibility of the various improvements, particularly for three challenging areas: the changes required through Petersburg, the track connection at Brico, and the station and track changes required between Algren and the proposed South Hampton Roads terminal station in Norfolk.
    - **Preferred Route Through Petersburg – Florida and SEHSR Raleigh and Charlotte trains:** Recently, it has been recommended that the north – south

route for these intercity and high-speed trains be revised from that initially recommended in a study prepared for the FRA. Rather than restoring the S Line between Centralia and Burgess, it has been determined that intercity and SEHSR trains would operate on an upgraded A Line between Centralia and South Collier. Trains destined for points on the A Line would continue southward, while S Line trains would utilize a restored Burgess Connection between South Collier and Burgess to access the S Line to Raleigh.

- **Preferred Route Through Petersburg – South Hampton Roads trains:** There are three options that appear to justify further study:
  1. Dunlop connection
  2. Ettrick connection
  3. North Collier connection

  Each of these options possess positive attributes, but each raises concerns in terms of cost, circuity, and station location. If there is to be one station, the more direct the route to South Hampton Roads, the more circuitous the routes to the south, and vice versa. For example, a downtown Station would require A and S Line trains to use connections from the NS Main Line to continue south.

  If a new high bridge, and a direct route to Collier is selected for SEHSR, The South Hampton Roads alternatives might require either:
  1. Dunlop connection - a separate station,
  2. Ettrick connection - a separate bridge, or
  3. North Collier connection - avoiding the Halifax Road overpass at North Collier, an additional main track on the NS Belt Line between North Collier and Poe, and a new interlocking East Poe to avoid the need to provide turnouts on the superelevated curve at Poe.

  The *Dunlop Connection* and the *Ettrick Connection* fulfill the planning requirements to reduce passenger train conflicts with NS freight operations in Petersburg, but each requires an additional Appomattox River Bridge. Although the Dunlop Connection requires a less-expensive bridge, it requires a restored right of way (that raises substantial neighborhood issues), and a second station (if the other trains continue to use a station on the A Line. The *North Collier Connection* can overcome conflicts with freight operations only at greater expense to provide some additional trackage and interlocking improvements. Further study is required to determine the extent of these tradeoffs.

- **Necessary commitments of the involved parties:** Implementation of the development concept, described in this report, for the Richmond–South Hampton Roads Corridor will require:
  - The commitment of the Commonwealth of Virginia, and other affected parties to obtain funding for the recommended improvements, to progress the necessary engineering work on a timely basis, and to arrange for any needed environmental/historic documentation; and
  - Officials of the Commonwealth of Virginia, the freight railroads, and local governments to close or upgrade as many highway-rail grade crossings as possible on this route.

  Cooperation of all parties is essential if the benefits of high-speed rail service are to be achieved.

Recommendations

The Richmond to South Hampton Roads High Speed Rail Feasibility study demonstrates that modern, fast passenger service is feasible in the study corridor. There are no "fatal flaws" that will prevent implementation of the service, but a substantial capital investment will be needed.

- **Improvements should be incremental.** A significant capital investment will be needed to make the necessary connections, upgrade the track and construct station facilities in order to allow trains to run at conventional speeds (maximum speed of 79 mph). A staged implementation plan should prioritize projects and lay out a reasonable schedule for implementing service at conventional speeds, then continuing to make improvements to allow higher speed operations.
- **Frequency matters.** This study clearly demonstrates that frequency of service is at least as important as speed in attracting riders to the service. Efforts should be made build capacity in order to maximize the frequencies as early in the implementation process as possible.
- **Cost is a direct function of speed.** The capital costs required to implement passenger service will increase significantly as the speed of the service is increased. As Norfolk Southern states in their policy on passenger service (See the Appendix to the Executive Summary) "Railroading is expensive. 110 mph railroading is very expensive." This study does not analyze operating costs, but it is clear that the cost of maintaining facilities and operating trains at higher speeds is substantially more expensive than conventional speed operations.

Next Steps

Extensive additional study and engineering will be needed to precisely define the scope of the proposed service improvements. In order to move this service proposal forward, the following actions should be taken:

1. **Additional study is needed to determine a preferred routing through Petersburg**. This study identifies three possible alignments through Petersburg. The Ettrick Connection is the alternative most favored by the localities. All three alternatives will involve significant capital investment in new rail infrastructure, including a new or rebuilt bridge across the Appomattox River. Further study is necessary to determine which of these alternatives will best serve South Hampton Roads trains and provide the best connections with the existing Amtrak service and the proposed Southeast High Speed Rail service.
2. **Additional marketing analysis is needed.** This study does not compare high speed rail service in the Route 460 corridor with the adopted proposal for service improvements on the Peninsula. In order to determine the relative benefits of improved service on the Peninsula and the proposed service to South Hampton Roads, a comprehensive marketing study of the entire Hampton Roads region should be conducted. Additional analysis of ridership in the Petersburg area is also needed to assist in developing routing and station alternatives. This study should include a comprehensive analysis of intercity travel patterns for the whole region and look at a variety of service scenarios that test high speed rail service on both sides of Hampton Roads. The study must also include an analysis of potential service to South Hampton Roads utilizing the proposed rail tube in the new Third Crossing tunnel.

3. **A phasing plan must be developed.** This feasibility study provides cost estimates only for the full proposed rail network. Costs were not estimated for the incremental service levels tested in the ridership analysis. A substantial portion of the estimated improvements will be necessary to implement the service at any speed: the Petersburg connection must be constructed and track expansions must be built to provide the necessary capacity for additional passenger trains. However some of the identified improvements, such as signal upgrades, will not be necessary for lower speed services. A phasing plan will identify the specific projects that are needed in order to accomplish the proposed intermediate levels of service.

4. **An estimate of operating costs must to be developed.** The scope of work for this feasibility study did not include an analysis of operating expenses. A detailed analysis of the operating costs of the various service scenarios should be included in any future study. This analysis is necessary to determine the full cost implications of proposed rail service and to help determine the most efficient service alternative.

5. **Further negotiations with the railroads are needed.** CSX and Norfolk Southern have vital concerns about the impact of proposed passenger service on their freight business in the corridor. The railroads want to ensure that enough capacity is provided to allow for them to maintain and grow their freight traffic without any impediment from the passenger trains. The railroads all also concerned about liability and safety issues. Both CSX and Norfolk Southern have developed passenger rail policies which state that passenger trains operating in excess of 90 mph must have a dedicated track. The Virginia Department of Rail and Public Transportation acknowledges this policy. We recognize that this issue has a major effect on high speed rail proposals throughout the country and will it will be addressed on a national level. The Department will work with the railroads to reach an agreement for service that is acceptable to all parties.